



METAL INDUSTRY INDICATORS



July 1997

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

The primary metals leading index was unchanged in June and three of the other four metal industry leading indexes were essentially flat in May, the latest month for which they are available. Although growth in the metal industry leading indexes has eased, the leading index trends still imply continued growth for most domestic metal industries in the months ahead.

Following eight consecutive monthly increases, the **primary metals leading index** was unchanged in June, holding at May's revised level of 125.4. The index's 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, slipped to 5.9% in June from a revised 6.5% in May. A solid gain in June's S&P stock price index for diversified machinery offset negative contributions from the length of the average workweek in primary metals establishments and the Purchasing Managers' Index to keep the June leading index unchanged from that of May. The only other component available for June, the growth rate of the Journal of Commerce metals price index, was little changed and its contribution rounded to zero.

The June primary metals leading index must be considered preliminary because only four of the eight leading indicators were available for its calculation. Since last February, the growth rates of the primary metals leading index have remained above 4.0%, the highest growth rates for this index in 3 years. A growth rate above +1.0% usually signals increased industry activity in the near term.

The **steel leading index** was flat in May, remaining at 104.3. The components for the S&P stock price index for steel companies and the Purchasing Managers' Index made the largest positive contributions. The average workweek, shipments of household appliances, new orders, and the growth rate of deflated M2 money supply were negative contributors in May. The growth rates of the steel leading index since the beginning of the year suggest that the steel industry will continue to experience slow growth in the near term.

The **aluminum mill products leading index** edged down 0.1% in May to 143.8 from an upwardly revised 144.0 in April. That revision to the April figure helped to keep growth in the index

relatively high, suggesting moderate growth in the aluminum mill products industry in the coming months.

At 236.4 in May, the **primary and secondary aluminum leading index** was essentially unchanged from a revised 236.3 in April. Decreases in the average workweek in primary aluminum establishments and the ratio of shipments to inventories for motor vehicles and parts offset increases in the LME spot price for aluminum and the S&P stock price index for aluminum companies. The 6-month smoothed growth rate for the primary and secondary aluminum index eased somewhat from its levels of the past 3 months, but it remains at 5.4%. This indicates that demand for primary aluminum is likely to remain healthy, however much of that demand may be satisfied by imports. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

The **copper leading index** rose 0.5% in May to 122.4 from a revised 121.8 in April. All of the increase in the leading index was attributable to two of the index's six components, the growth rate of the LME spot price of primary copper and the MII stock price index for copper companies. Although the copper leading index's 6-month smoothed growth rate of 3.3% indicates an upward near-term trend for industry activity, growth will likely remain flat because of capacity constraints in the copper industry.

With the exception of a 0.1% increase in the copper coincident index, all the **metal industry coincident indexes**, which measure current activity, decreased in May, the latest month for which they are available. The largest decreases, 0.8% and 0.7% respectively, were in the coincident indexes for aluminum mill products and primary and secondary aluminum. Although, the 6-month smoothed growth rates of the leading indexes have been relatively strong,

growth in the metal industry coincident indexes has been slow thus far in 1997.

Metals Price Leading Index Moves Lower

The leading index of metal prices decreased 0.5% in May to 95.6 from a revised 96.1 in April. Its 6-month smoothed growth rate of -0.1% was the first negative rate since June 1995. The three index components that were available for the May index calculation all declined. The growth rate of the deflated M2 money supply accounted for over one-half of the May decline, with the growth rates of the deflated value of new orders for U.S. nonferrous metals and new housing units authorized by building permits accounting for the rest of the decline. The fourth index component, the growth rate of the Organization for Economic Cooperation and Development total leading index, is available only through April.

During April it experienced its sharpest 1-month drop since November 1987. The metals price leading index signals significant changes in price growth an average of 7 months in advance.

The growth rate of the deflated value of nonferrous metal products inventories held in the United States decreased to -5.4% in May, the lowest rate in over 2 years. The decline in inventory growth suggests most metal prices may continue to see some growth in the months ahead. However, the latest trend in the metals price leading index implies that price growth may be weak.

It is important to recognize that the business cycle and inventories are only two factors in price determination. Other factors that affect prices include changes in metals production, speculation, strategic stockpiling, and production costs. (An explanation of these indexes and the 6-month smoothed growth rates appears on page 12.)

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

		Six-Month Smoothed Growth Rates				
	Leading Index of Metal Prices (1967=100)	MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
1996						
May	94.8r	-12.8	3.5r	-14.1	-16.6	1.1
June	95.2	-29.3	6.6r	-21.6	-45.4	-2.2
July	95.4r	-24.1	11.0r	-16.6	-39.9	-7.6
August	95.6r	-20.9	10.6r	-15.6	-33.3	-5.8
September	95.0r	-26.8	10.9r	-23.5	-37.6	-1.3
October	94.9r	-21.1	9.2r	-16.6	-31.7	-13.3
November	95.2r	2.1	6.3r	-2.8	11.8	-26.3
December	95.3r	-6.9	5.3r	-2.0	-11.2	-21.8
1997						
January	96.2r	6.5	-0.2r	9.8	6.6	-6.6
February	96.8r	11.0	-0.7r	12.7	10.5	3.7
March	96.8r	10.4	-3.8r	10.1	11.2	-3.3
April	96.1r	9.7	-3.6r	10.8	12.2	-8.5
May	95.6	18.4	-5.4	11.0	30.7	2.0
June	NA	15.0	NA	5.1	25.8	3.4
<i>r - Revised</i>						
Note:	The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.					
Sources:	U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).					

Link To:

Chart 1.

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
July	119.3r	1.0r	107.4r	3.3
August	120.0r	1.9r	108.1r	3.8
September	119.9r	1.5r	108.3r	3.8r
October	120.1r	1.7r	109.0r	4.5r
November	120.4r	1.8r	108.7r	3.4r
December	121.5r	3.2r	109.0r	3.5
1997				
January	121.6r	3.0r	109.1r	3.0r
February	122.8r	4.2r	109.7r	3.5r
March	123.7r	5.1r	109.8r	3.2r
April	124.3	5.5r	110.6r	3.9r
May	125.4r	6.5r	110.2	2.8
June	125.4	5.9	NA	NA

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

Leading Index		May	June
1. Average weekly hours, primary metals (SIC 33)		-0.3r	-0.6
2. S&P stock price index, machinery, diversified		0.6r	0.9
3. Ratio of price to unit labor cost (SIC 33)		0.4	NA
4. JOC metals price index growth rate		0.1r	0.0
5. New orders, primary metals, (SIC 33) 1982\$		-0.1	NA
6. Index of new private housing units authorized by permit		0.0	NA
7. Growth rate of U.S. M2 money supply, 1992\$		-0.2	NA
8. Purchasing Managers' Index		0.3r	-0.3
Trend adjustment		0.0	0.0
Percent change (except for rounding differences)		0.8r	0.0
Coincident Index		April	May
1. Industrial production index, primary metals (SIC 33)		0.1r	0.2
2. Total employee hours, primary metals (SIC 33)		0.2r	-0.3
3. Value of shipments, primary metals, (SIC 33) 1982\$		0.3r	-0.3
Trend adjustment		0.1	0.1
Percent change (except for rounding differences)		0.7r	-0.3

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA: Not available r - Revised

Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

Links To:

Chart 2.

Chart 3.

Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
June	103.4r	1.9r	98.5r	2.5r
July	102.5r	-0.2	98.9r	2.9r
August	102.2r	-1.0	98.5r	1.7r
September	102.1r	-1.1r	98.6r	1.6
October	101.6r	-2.0r	98.9r	2.0
November	102.2r	-0.8	98.2r	0.3
December	103.0r	0.6r	98.7r	1.1r
1997				
January	103.3r	1.2	99.3r	2.1r
February	104.1r	2.4r	99.0r	1.2
March	104.6r	3.1r	99.2r	1.2r
April	104.3	2.4r	99.7r	2.1r
May	104.3	2.3	99.4	1.0

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 5.
The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

Leading Index	April	May
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	0.2r	-0.3
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982\$, (SIC 331)	0.2r	-0.2
3. Shipments of household appliances, 1982\$	-0.1	-0.2
4. S&P stock price index, steel companies	-0.1	0.4
5. Industrial production index for automotive products	-0.4r	0.1
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	-0.1	0.1
7. Index of new private housing units authorized by permit	-0.1	0.0
8. Growth rate of U.S. M2 money supply, 1992\$	0.2	-0.2
9. Purchasing Managers' Index	-0.1	0.3
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-0.3r	0.0
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	0.2r	0.2
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982\$	0.1r	-0.3
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	0.2r	-0.4
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.6r	-0.4

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

NA: Not available r - Revised

Links To:

Chart 4.

Chart 5.

Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
June	139.8	3.8	121.8	-0.8
July	139.2	2.3	123.2	1.5
August	139.5	2.1	124.2	3.0
September	141.1	4.1	125.4	4.6
October	138.4	0.1	123.8	1.8
November	140.0	2.0	124.4	2.5
December	140.6	2.7	124.5	2.5
1997				
January	141.7	3.9	123.0	-0.3r
February	143.8r	5.9	125.5r	3.0r
March	143.5	4.7r	126.4r	3.9r
April	144.0r	4.7r	125.8r	2.6r
May	143.8	3.9	124.8	0.8

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 7.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index		April	May
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)		-0.2r	-0.1
2. Index of new private housing units authorized by permit		-0.1	0.0
3. Industrial production index for automotive products		-0.5r	0.1
4. Construction contracts, commercial and industrial (square feet)		0.6	0.2
5. Net new orders for aluminum mill products (pounds)		0.4	-0.6
6. Growth rate of U.S. M2 money supply, 1992\$		0.2	-0.2
7. Purchasing Managers' Index		-0.1	0.4
Trend adjustment		0.1	0.1
Percent change (except for rounding differences)		0.4r	-0.1
Coincident Index			
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)		-1.3r	-0.2
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)		0.7r	-0.3
3. Shipments of aluminum mill products (pounds)		0.0r	-0.3
Trend adjustment		0.1	0.1
Percent change (except for rounding differences)		-0.5r	-0.7

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

NA: Not Available r - Revised

Links To:

Chart 6.

Chart 7.

Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
June	118.8r	1.6r	112.5	0.8
July	118.6r	1.0r	112.9	1.4
August	118.8r	1.1r	112.3	0.2
September	118.9r	1.0r	113.8	2.7
October	119.3r	1.5r	115.1	4.4
November	121.1r	4.0r	113.3	1.0
December	120.3r	2.3r	114.4	2.8
1997				
January	120.2r	1.8r	113.6	1.1
February	122.0r	4.1r	114.0r	1.6r
March	123.7r	6.3r	113.7r	0.7r
April	121.8r	2.6	114.1r	1.1r
May	122.4	3.3	114.2	1.2

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	April	May
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.4	-0.2
2. New orders, nonferrous and other primary metals, 1982\$	0.0r	0.0
3. MII stock price index, copper companies	-0.3	0.3
4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	-0.9	0.0
5. Growth rate of the LME spot price of primary copper	0.0	0.4
6. Index of new private housing units authorized by permit	-0.1	0.0
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-1.7r	0.5
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.1	0.3
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.2	0.2
3. Copper refiners' shipments (short tons)	0.4	-0.4
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.4	0.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3 and 5 of the leading index.

NA: Not available r - Revised

Links To:

Chart 8.

Chart 9.

Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930's. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.¹

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

Three of the metal industry coincident indexes, those for primary metals, steel, and aluminum mill products, reflect their classifications in the U.S. Standard Industrial Classification (SIC). The SIC is the main classification used by the United States government and industry in collecting and tabulating economic statistics. Two of the coincident indexes, one for copper and one for primary and secondary aluminum, are blends of two different copper and aluminum industries, respectively.

Of the five metal industries, primary metals is the broadest, consisting of twenty-six different metal processing industries. The steel, aluminum, and copper industries are parts of the primary metals industry.

The metal industry leading indexes turn before their respective coincident indexes an average of 9 months for primary metals, 8 months for steel, and 7 months for copper. The average lead time for the leading indexes of aluminum mill products and primary and secondary aluminum is 6 months.

¹**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

The leading index of metal prices, also published in the Metal Industry Indicators, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 7 months in advance.

The growth rate used in the Metal Industry Indicators is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[\left(\frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EDT, Tuesday, August 26. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for Metal Industry Indicators on the World Wide Web is: <http://minerals.er.usgs.gov/minerals/pubs/mii/>

The **Metal Industry Indicators** is produced at the U.S. Geological Survey by the Minerals Information Team. The report is prepared by Kenneth Beckman (703-648-4916), e-mail (kbeckman@usgs.gov), and Gail James (703-648-4915), e-mail (gjames@usgs.gov). The Center for International Business Cycle Research at Columbia University and the former U.S. Bureau of Mines developed the metal industry leading and coincident indexes. Customers can send mail concerning the Metal Industry Indicators to the following address:

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